



NEWS 2014

Educational Equipment & solutions for Technical Training Institutes & Universities



Technical furniture | Motors & Electro-technic | Training systems & Models | Renewable energy
Measuring apparatus | Kits & Components | Accessories

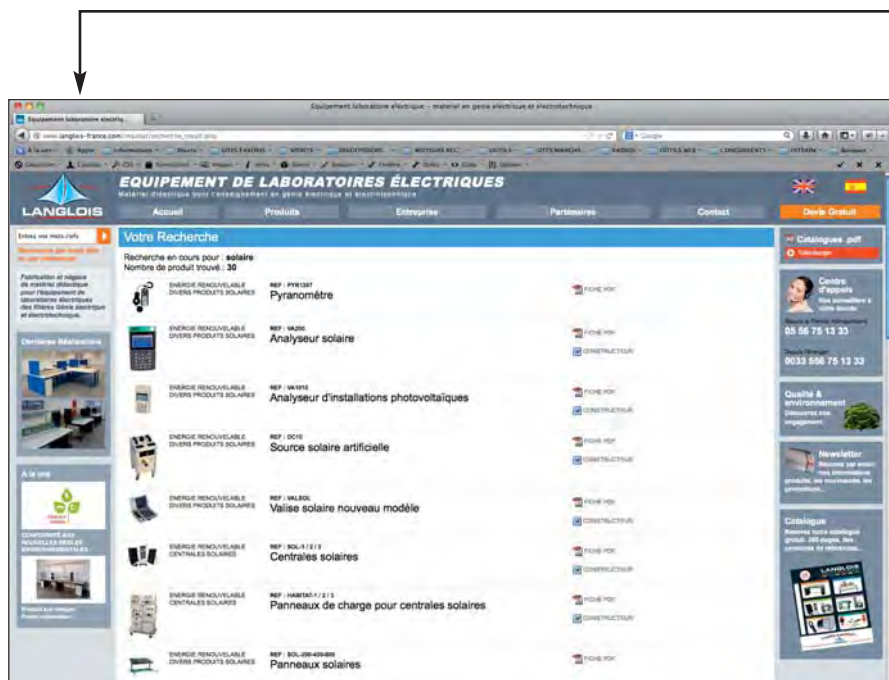


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FAST SEEK OF PRODUCTS

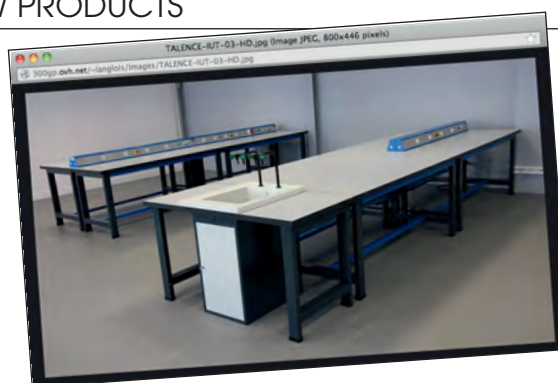
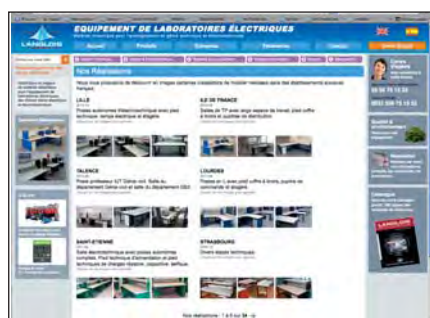


Use the internal search engine to seek by key words or reference.

REF : VA1010	Analyseur d'installations photovoltaïques	FICHE PDF
		CONSTRUCTEUR
REF : DC10	Source solaire artificielle	FICHE PDF
		CONSTRUCTEUR
REF : VALSOL	Valise solaire nouveau modèle	FICHE PDF
		CONSTRUCTEUR
REF : SOL-1 / 2 / 3	Centrales solaires	FICHE PDF
		CONSTRUCTEUR

Page of results

VIEW OUR FULL RANGE AND NEW PRODUCTS



DOWNLOADABLE PDF DATASHEETS & CATALOGUE

Access immediately to the downloadable PDF datasheets



Variable power supplies with integral speed controller



Ref. AL40-AC



Top Ref. AL40-DC



Cable storage and sockets at rear.

The cabinet door open and close by key.

Power supplies on wheels with speed controller 2kW, 4kW, AC and/or DC according to the version selected.

Main start/stop and emergency stop controls on the front. Each voltage output is active from a Start/Stop switch. An indicator light signals their operation. A complete measuring unit displays the alternating values of consumption of the workstations. Other sources are not taken into account in these measurements.

All the outputs are protected against overloads and short circuits.

MEASURING UNIT (on AC and ACDC models)

Simple to use thanks to 6 keys on front, it displays the electrical values of the variable three-phase + fixed three-phase + AC speed controller outputs:

- current in each phase.
- phase-to-ground and composite voltage.
- frequency.
- active, reactive and apparent power in each of the phases and in three-phase.
- power factor in each phase and in three-phase.
- total harmonic distortion for current and voltage.
- measurement of active, reactive and apparent energy on 4 dials.

REMOTE CONTROL OF THE MEASURING UNIT

An RJ45 connector on the front of the cabinet enables the unit to be used remotely by means of an integral web page which displays the electrical values measured.

Dims: AL20-DC / AL20-AC / AL40-DC / AL40-AC : 500 x 500 x 980mm. Weight 90kg.

Dims: AL20-ACDC / AL40-ACDC : 500 x 800 x 980mm. Weight 175kg.

POWER 4000VA									
Ref.	VARIABLE BY AUTOTRANSFORMER				3-PHASE 3x400VAC measuring by CM	SPEED CONTROLLER DC 3KW	SPEED CONTROLLER AC 4KW measuring by CM	3 SOCKETS 230V 2P+T	MEASURING UNIT CM
	DC 0-270VDC-16A	3-PHASE 0-450VAC-8A	DC AUXILIARY 0-250VDC-2.5A	AC AUXILIARY 0-250VAC-2.5A					
		measuring by CM							
AL40-DC	✓		✓	✓		✓		✓	
AL40-AC		✓	✓	✓	✓		✓	✓	✓
AL40-ACDC	✓	✓	✓	✓	✓	✓	✓	✓	✓

POWER 2000VA									
Ref.	VARIABLE BY AUTOTRANSFORMER				3-PHASE 3x400VAC measuring by CM	SPEED CONTROLLER DC 2KW	SPEED CONTROLLER AC 2KW measuring by CM	3 SOCKETS 230V 2P+T	MEASURING UNIT CM
	DC 0-270VDC-8A	3-PHASE 0-450VAC-5A	DC AUXILIARY 0-250VDC-2.5A	AC AUXILIARY 0-250VAC-2.5A					
		measuring by CM							
AL20-DC	✓		✓	✓		✓		✓	
AL20-AC		✓	✓	✓	✓		✓	✓	✓
AL20-ACDC	✓	✓	✓	✓	✓	✓	✓	✓	✓

Variable DC 0-270VDC
With isolating transformer, to standard NFC 61558.
Rectification is generously oversized (ripple factor 4%).
Output on 4mm terminal valid provided the autotransformer is at 0 voltage.
Viewing by voltmeter and ammeter.

Variable three-phase 0-450VAC
The proposed voltage is 0-430V between phases (450V for 4000VA model).
Output on 4mm terminal valid provided the autotransformer is at 0 voltage.

Auxiliary 0-250VDC
With isolating transformer, to standard NFC 61558.
Viewing by voltmeter and ammeter.
Double alternating rectification, the ripple factor of which varies with the charge.

Auxiliary 0-250VDC
Viewing by voltmeter and ammeter.
3-phase 3x400V on 4 terminals.

DC speed controller
Operation 1 quadrant, from 1.5 to 3kW, outputs for armature 180V-16A and field system 210V-3A on 4mm terminals.
Adjustment of the rotation speed setting by potentiometer on the front.

AC speed controller
Operation 1 quadrant, 2 or 4kW outputs 3x400VAC on 4mm terminals.
Adjustment of the rotation speed setting by potentiometer on the front.
Configuration with SOMOVE software supplied.

Study of the 1500VA three-phase transformer



Upper face
4 multi-displays show the active powers, voltages, currents and power factors at the primary and at the secondary.
Engraved synoptic equipped with safety sockets to facilitate the wiring.



ref. ETT-1500

EDUCATIONAL OBJECTIVES

- Study of a 3-phase transformer with no load, in short-circuit and loaded
- Creation of Star / Delta wiring according to the primary/secondary voltages selected
- Electrical measurements of the different values
- Calculation of the powers with the method of the 2 wattmeters

TEACHING RESOURCES & PRACTICAL WORK

Proposed practical work

- Understanding of the characteristics given on the identification plate
- Readings of the characteristics with no load, in short-circuit and loaded
- Study and influence of the different primary and secondary couplings
- Calculation of the transformation ratio
- Study of the clock hour figure
- Power statement with the method of the 2 wattmeters
- Study of the equivalent diagram for one phase

COMPOSITION OF THE MOBILE CABINET ON WHEELS

- Emergency stop, main switch, 'On' indicator light
- Primary and secondary electrical protection
- Variable three-phase autotransformer
- 1500VA three-phase transformer
Primary 3 x 230V / Secondary 3 x 230V separate windings
- 4 digital multi-displays (2 at primary and 2 at secondary) showing the active power, voltage, current and $\cos\phi$
- 4mm safety terminals including 3 at secondary for connecting a load
- HYPRA plug with 3-m lead for linking to the three-phase network
- Dimensions: 710 x 600 x 375mm - Weight: 72 kg
- Supply voltage: 3 x 400V-AC 50Hz + N + E

An autotransformer enables the voltage at the primary to be varied.

Separate windings allow for practical work with no load, in short-circuit, and loaded with different Star or Delta couplings.

Training model of single-phase transformer 140VA



ref. ETM140

EDUCATIONAL OBJECTIVES

- Theoretical practical study of a single-phase transformer with no load and loaded.
- Studying the electromagnetic induction

User's manual with theoretical study

ETM140 allows the study of a single phase transformer. It is made up with a portable console which includes:

- 1 X 140VA single phase transformer
Primary: 230V power supply. Use: 240V protected by fuses and output on safety terminals.
Secondary: 1 x 15V/3.6A winding, 2 x 12V/3.6V independent windings, fuses protected and output on safety terminals.
- 3 displays on the primary (Current – Voltage – Power) show the absorbed electric values.
- 6 displays on the secondary (2 x Current – 2 x Voltage – 2 x Power) show electric values of secondary outputs.
- 1 variable single phase autotransformer, 0-240V 2.5A output, fuses protected, with safety terminals, can supply the transformer primary.
- 1 set of Ø4mm safety test leads.

User's manual includes: A theoretical study about single phase transformer and practical works with the 140VA transformer.

Specifications:

- Dimensions: 1000x160x180mm + handle
- Weight: 16kg
- Supply: 230V mains cable

Hypersynchronous study set



3-phase asynchronous motor
Ref. MAS22 - Qty 2
230/400 VAC- 1,5KW
with housings
(Features P. 76)

Stand on wheels
Ref. CTA - Qty 1
Guide rails
Ref. RGA - Qty 1
(Features P. 81)



Display unit of the power factor
Ref. PSY-C - Qty 1
Indicates from 0.5 inductive to 0.5 capacitive with "1" vertical in the center of the dial.



Display unit of the central zero power
Ref. PSY-W - Qty 1
Indicates from -1.5kW to 1.5kW with the vertical zero in the center of the dial.



Speed controller
Ref. ACVAR5 - Qty 1
Mains single-phase 230VAC,
output 3 x 230VAC- 1.5KW
(Features P. 95)



1 Capacitive load bank
Ref. CH20 - Qty 1
Widely sized
(Features P. 106)



Set of 47 safety leads
Ref. 300S - Qty 1 set
(features P. 254)

1 switching case
For an easy synchronization on the national electrical network

An asynchronous motor can convert mechanical energy into electrical energy. To perform this conversion, it has to be driven above the synchronous speed. PACK-HYPER is a set of 2 asynchronous motors mounted on the same axis of rotation with accessories to study hypersynchronous behaviour. The speed controller drives the first motor above its synchronous speed so that the second becomes a three-phase generator. A central zero wattmeter indicates the direction of the electrical energy consumed or fed in the case of feeding into the grid. A central COS ϕ phase-meter demonstrates the change of COS ϕ following the addition of capacitors or speed variation.

EDUCATIONAL OBJECTIVES

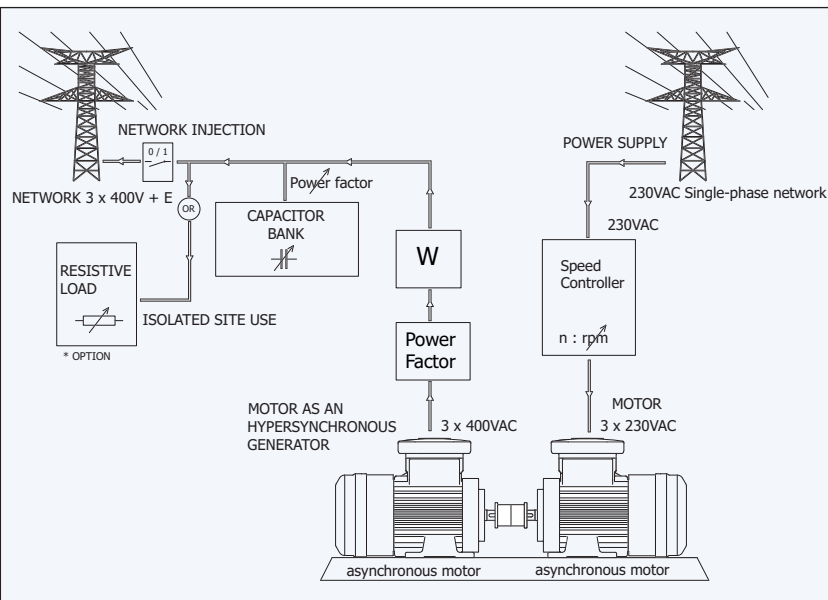
- Studying the hyposynchronous and hypersynchronous operations of an asynchronous motor.
- Studying the effect of a battery of capacitors on the COS ϕ value.
- Studying synchronisation with the national grid.
- Studying energy use at an isolated site.
- Calculating the outputs of an energy production system.
- Using a clamp ammeter.

TEACHING RESOURCES STUDENT & TEACHER

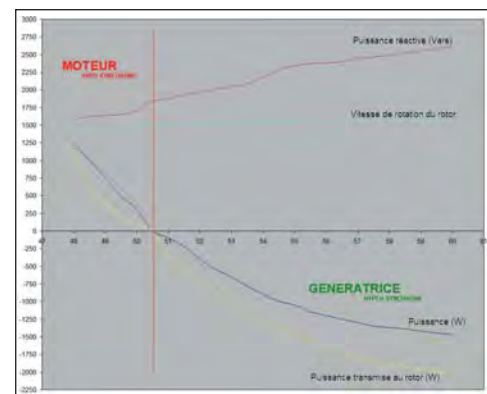
Proposed practical work

- Procedure of synchronisation with the national grid.
- Hyposynchronous and hypersynchronous measurement.
- Reading COS ϕ using a battery of capacitors and consequences.
- Plotting of the electrical characteristics of the energy production system.
- Calculation of the overall output.
- Study of the operation at an isolated site.

ref. PACK-HYPER



OPTION
2000W Resistive load
Ref. RHP20 - Qty 1
(features P. 107)



Supervision units for electric motor benches Schneider® tools & equipment

The MTD series is a complete system for monitoring a 1500W motor bench. From a PC or touch screen (according to the version), the supervisor controls and observes the operation of a bench. The electrical cabinet encloses the PLC, the speed controller and the protection devices required for the supervision and control functions. Settings and supervision software is supplied. The supervision unit is fully programmed, ready to run and open to all modifications without restriction.

General features

- Technical cabinets with braked wheels.
- High-temperature 40 mm laminated top 750 x 670 mm.
- Console, dimensions 350 x 160 x 180 mm
- Overall dimensions: 750 x 670 x (h) 1210 mm (1460 mm touch version).
- Power supply by single-phase mains cord 230V AC.

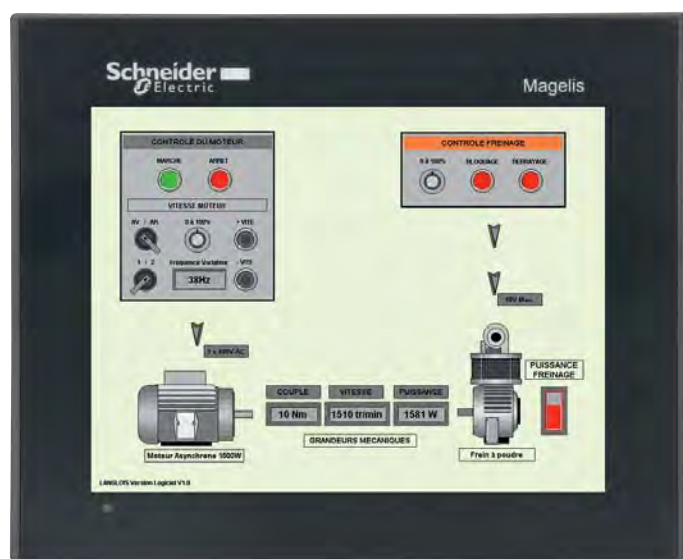
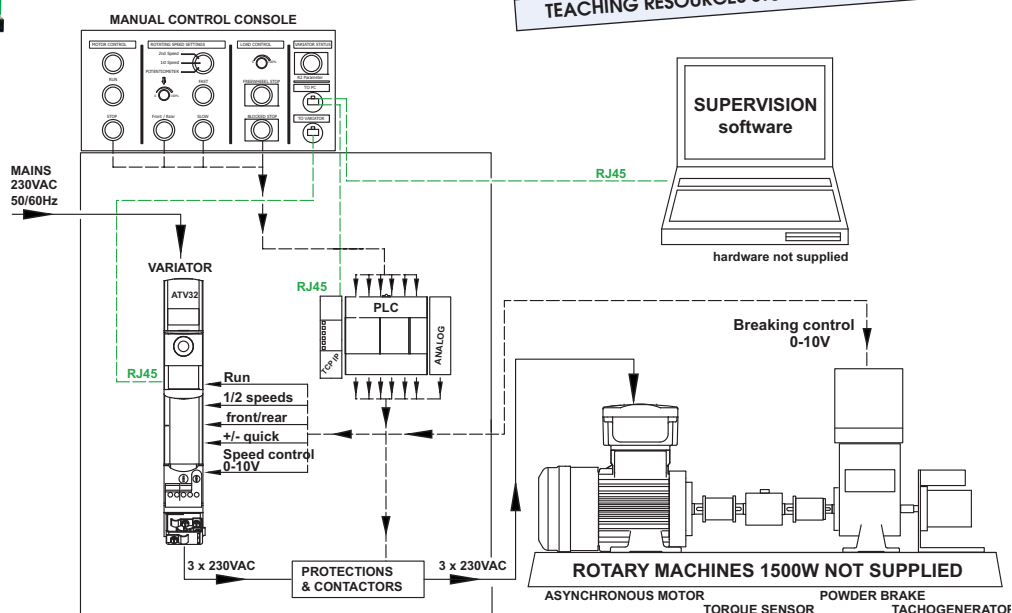
Software supplied with all versions

- SoMove: For settings on the speed controller.
- PLC software: For settings on the PLC.
- VijeoDesigner: For supervision. Fully programmed, ready to run. Modifiable to create your own supervision.

	To be combined with a 1500W motor bench (not supplied) equipped with: Essential: 1 MOTOR + 1 POWDER BRAKE Recommended: 1 torque sensor + 1 tacho-generator			To be combined with a 1500W motor bench (not supplied) equipped with: Essential: 1 motor + 1 three-phase alternator Recommended: 1 torque sensor + 1 tacho-generator		
REF	MTD1	MTD2	MTD3	MTD4	MTD5	MTD6
						
Controls by	Integral 10-inch touch screen	Your PC	Your PC or Manual (on console)	Integral 10-inch touch screen	Your PC	Your PC or Manual (on console)
Supervision by	Integral touch screen	Your PC	Your PC	Integral touch screen	Your PC	Your PC
Controls and Supervision	On the motor Start Stop - Speed 0 to 1600 rpm - 1st and 2nd speed of rotation - Forward/Back Operation - Speed of rotation (+ and -) - Motor overload - Display of torque and speed (if brushless torque sensor) On the brake: From 0 to 100% - Blocking - Free wheel Other: Speed controller overload			On the motor Start Stop - Speed 0 to 1600 rpm - 1st and 2nd speed of rotation - Forward/Back Operation - Speed of rotation (+ and -) - Motor overload - Display of torque and speed (if brushless torque sensor) On the alternator: Voltage variation at terminals of rotary field. On the resistive load: load variation from 0 to 100% in 6 steps.		
Equipment of the console	Emergency stop General Start/Stop 2 RJ45 sockets Mains socket 230V Touch screen colour	Emergency stop General Start/Stop 2 RJ45 sockets Mains socket 230V	Emergency stop - General start/stop 2 RJ45 sockets Mains socket 230V Motor, Load & Speed control	Emergency stop General Start/Stop 2 RJ45 sockets Mains socket 230V Touch screen colour	Emergency stop General Start/Stop 2 RJ45 sockets Mains socket 230V	Emergency stop - General start/stop 2 RJ45 sockets Mains socket 230V Motor, Load & Speed control
Equipment of the cabinets	• Front door, closing by 2 key locks: Control panel with indicator lights (marked PVC panel). Transparent panel: view of the speed controller and PLC information. Safety system cutting off electrical distribution if opened. • Rear door, closing by 2 key locks: Large PVC surface with complete wiring diagram. Safety terminals 4 mm and connection sockets for: - Earths - Three-phase asynchronous motor 3 x 230V AC - 1500W - Brushless torque sensor (Din. socket) - Powder brake. - Tacho-generator 0-10/20/60V for 1000 rpm • Main components Differential 30mA and magneto-thermal circuit-breakers. Contactor for motor control. PLC software with 24 Inputs/24 Outputs binary, Ethernet RJ45. Analogue board 4 Inputs 0-10V DC and 2 Outputs 0-10V DC Speed controller ATV32, 1500W - 3 x 230V AC.			• Front door, closing by 2 key locks: Control panel with indicator lights (marked PVC panel). Transparent panel: view of the speed controller and PLC information. Safety system cutting off electrical distribution if opened. • Rear door, closing by 2 key locks: Large PVC surface with complete wiring diagram. Safety terminals 4 mm and connection sockets for: - Earths - Three-phase asynchronous motor 3 x 230V AC - 1500W - Brushless torque sensor (Din. socket) - Powder brake. - Tacho-generator 0-10/20/60V for 1000 rpm • Main components Differential 30mA and magneto-thermal circuit-breakers. Contactor for motor control. PLC software with 24 Inputs / 32 Outputs binary, Ethernet RJ45. Analogue board 4 Inputs 0-10V DC and 2 Outputs 0-10V DC Speed controller ATV32, 1500W - 3 x 230V AC. Power supply controlled from the PLC. Powers the rotary field. Resistive load of 2kW can be controlled from 0 to 100% of load in 6 steps.		

BLOCK DIAGRAM OF MTD3 VERSION WITH 1500W MOTOR GROUP

TEACHING RESOURCES STUDENT & TEACHER



EXAMPLE OF SUPERVISION ON TOUCH SCREEN OF MTD1 MODEL
(MOTOR + POWDER BRAKE)



EXAMPLE OF SUPERVISION ON PC OF MTD5 MODEL
MOTOR + THREE-PHASE ALTERNATOR

ACQUISITION OPTION

All the versions shown are compatible with the acquisition option.

Enables the acquisition of:

- electrical values (Voltage - Current - Absorbed power).
- mechanical values (Torque - Speed - Power).

Supplied with measuring panel and acquisition software.

This option requires a bench that should be equipped with a brushless torque sensor and tacho-generator.

Add -ACQUI to the end of the reference. Example: MTD4-ACQUI

Factory assembly only.

ref. -ACQUI



Cabinet for electrical authorization



The service voltage of 24VDC, protected by fuse and circuit-breaker, makes use of the cabinet completely safe. The integrated load, comprised of six 60W lamps, enables a sufficiently significant current to be generated. The cabinet is self-contained and requires no connection to the mains 230V when in use. A mains cable is nevertheless included for recharging the batteries using an integral charger. Available in 2 versions, fixed or mobile.

ref. HABILIT24 Fixed version

ref. HABILIT24-S Mobile version with base on wheels

EDUCATIONAL OBJECTIVES

- Put into application the knowledge, rules and methods for certification for authorization to electrical hazards
- Carry out practical assignments, wiring tasks relevant to electrical authorization
- Perform maintenance and cleaning operations in an industrial cabinet
- Perform removal from service operations of electrical equipment
- Take measurements using a clampammeter

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Reminder on electrical authorization
- Changing sets of copper busbars
- Removing the cabinet from service
- Complete the removal from service and authorization documents
- Check correct use of PPE
- Reading the current in the electrical cabinet using a clamp ammeter

Comprises

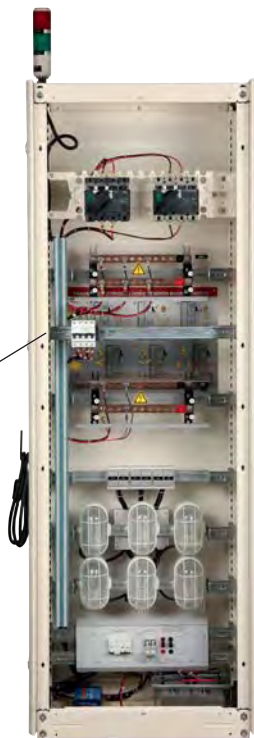
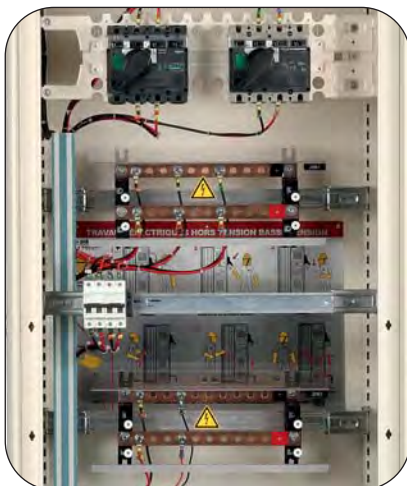
- 1 main source and one secondary source 24VDC distributed on 2 sets of flat copper busbars, 100A
- 2 disconnectors with visible cutting, for padlocking
- 2 special circuit-breakers DC 10A
- 1 set of protection devices by fuse + RC circuit-breaker 10A-10mA, IS type
- 4 gel batteries 12V/14Ah
- 3 dual switches
- 6 bulkhead lights 24VDC-60W
- 1 battery charger 230VAC/24VDC
- 1 panel of safety instructions for electrical authorization
- 1 2-colour light column indicating 24VDC 'on' and battery recharging
- 1 lot of 2 posts + 5m of red and white chain
- 1 insulating mat
- 1 insulating blanket
- 2 removal-from-service padlocks

Features

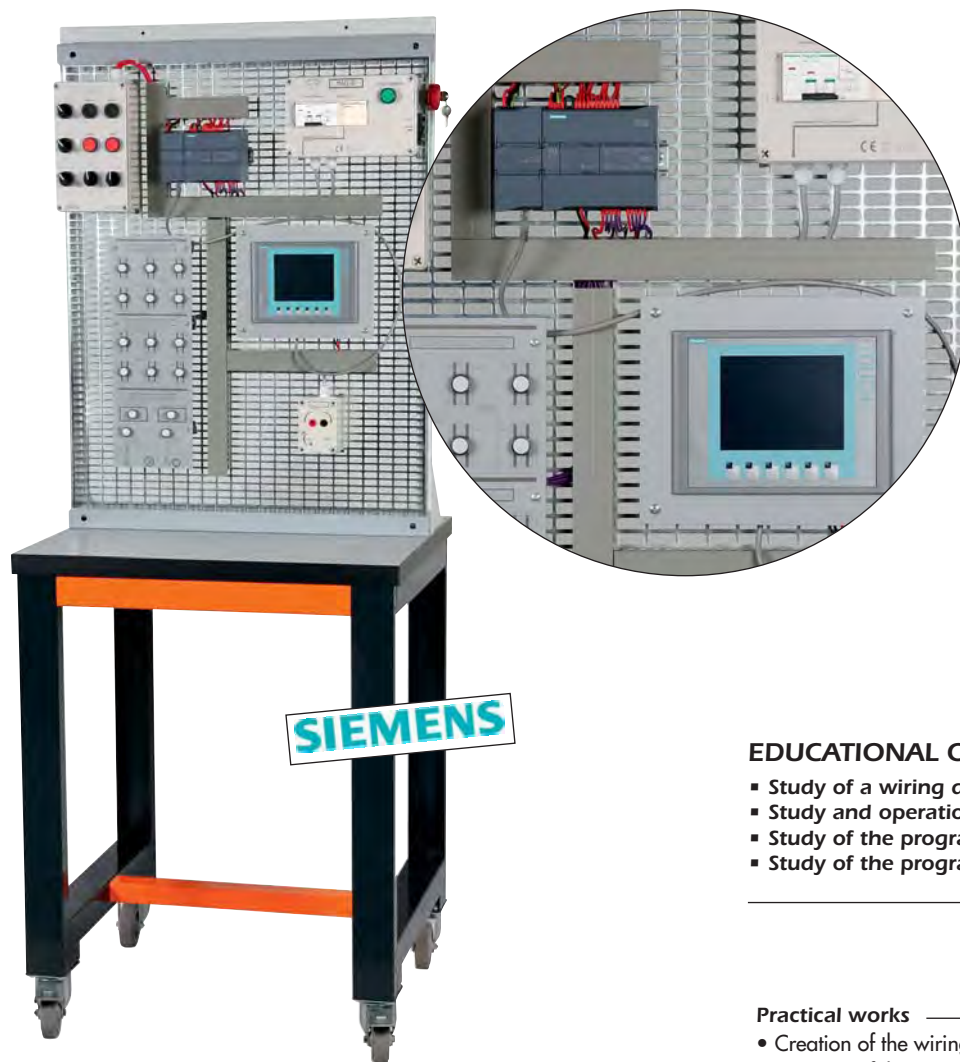
- 3-metre mains lead for battery charger
- Dimensions: HABILIT24: 450 x 700 x h 2000mm - Weight: 96 kg
HABILIT24-S: 600 x 800 x h 2120mm - Weight: 111 kg

Above HABILIT24-S version, mobile version.
Below HABILIT24 version, fixed.

Close up on disconnectors, busbar sets and panel of safety instructions attached to the cabinet bottom.



Study model for the PROFINET system with supervision – SIEMENS®



PROFINET is an open communication standard for industrial automation.

Developed by SIEMENS, PHOENIX Contact, MOLEX and other constructors, it provides automation solutions for processes, production and movement control.

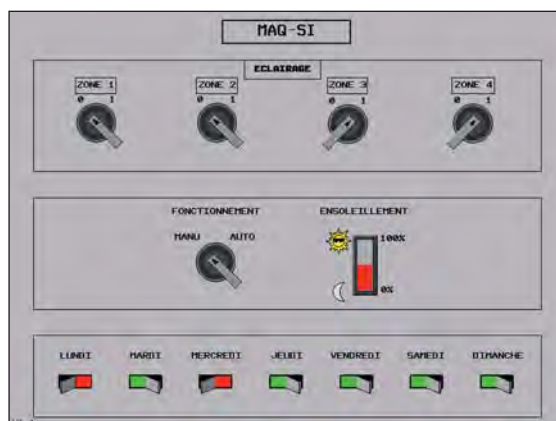
Through its opening and the use of standard communications media (Ethernet), PROFINET enables the use of all brand of equipment.

MAQ-SI is a study system equipped with SIEMENS® components and designed for understanding the PROFINET system with programmable controller, touch screen and standard pushbuttons.

MAQ-SI uses the simulation of lighting commercial spaces to facilitate the teaching process.

ref. MAQ-SI

ref. MAQ-SI-N (without table)



EDUCATIONAL OBJECTIVES

- Study of a wiring diagram developed in automation.
- Study and operation of a PROFINET® computer network
- Study of the programming of a SIEMENS® PLC.
- Study of the programming of an HMI (Human Machine Interface).

TEACHING RESOURCES STUDENT & TEACHER / VIDEO

Practical works

- Creation of the wiring diagram
- Creation of the PROFINET computer network
- Creation of the PLC programs in contact language
- Creation of the supervision from the HMI (Human Machine Interface).
- Change of IP addressing
- Test of the assembly

Features of the basement

- Base on wheels
- Dim L x l x H : 750 x 670 x 1950mm
- Weight : 60kg

Composition of the model

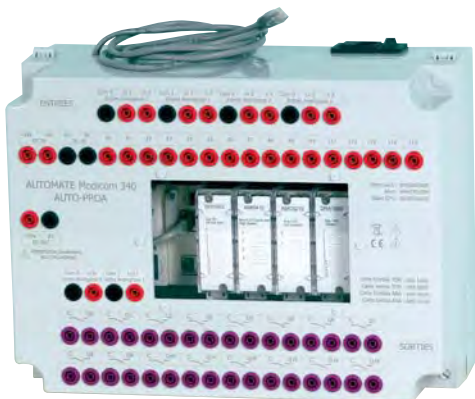
Power supply from the mains 230VAC – Mains lead 3m.

- 1 unit with magneto-thermal protection, residual current device 30mA and emergency stop.
- 1 SIEMENS PROFINET S7-1200 14 inputs/10 outputs PLC with analogue board 4-20mA / 0-10V.
- 1 SIEMENS KTP600 PROFINET touch screen 5.7 inches, 256 colours.
- 1 Day/Night simulation unit 4-20mA / 0-10V.
- 1 printed face with 16 indicator lights.
- 1 control unit with 4 pushbuttons and 5 switches.
- 1 Ethernet RJ45 switch
- 6 Ethernet leads, 1.5 metres

Integrated PLC units



MAT-BOX



AUTO-PRO-A



AUTO-238-A

Ref.	MAT-BOX	AUTO-221	AUTO-221-A	221-MAX
Brand	SIEMENS	SCHNEIDER		
Model	SIMATIC S7-1200	M221		
Number of Inputs	14 inputs 24VDC			30 inputs 24VDC
Number of outputs	10 All or Nothing outputs 2A max on resistive load	10 All or Nothing outputs 2A max		26 All or Nothing outputs 2A max
Analog	2 inputs 0-10VDC 1 output 0-10VDC or 4-20mA	no	2 inputs PT100 1 output 0-10VDC or 4-20mA	2 analog inputs 0-10V
Ethernet	yes + 1 mini switch 4 ports RJ45	yes		
Software	LOG-STEP (in option)	SoMachine Basic (supplied)		
Power supply	230VAC-50/60Hz by means of socket unit+ switch			
Dimensions	330 x 200 x 80mm	330 x 200 x 80mm		380 x 280 x 180mm
Supplied with	1 Ethernet RJ45 3-m cable. 6 detailed practical works (PLC configuration, use and programming.)	1 Ethernet RJ45 3-m cable. 1 USB cable PC/PLC		

Integrated touchscreen units

Ref.	TOUCH-BOX	STU-BOX4	STU-BOX6
Brand	SIEMENS	SCHNEIDER	
Modèel	Simatic KTP600	HIMISTU	
Touchscreen	5,7" TFT 256 colours	3,5" 65536 colours	5,7" 65536 colours
Resolution	320 x 240 pixels		
Ethernet	1 RJ45 connector	6 RJ45 connectors (Including 1 5 ports switch)	1 RJ45 connector
USB	-	1 USB connector	
Software	LOG-STEP (in option)	VijeoDesigner (supplied)	
Power supply	230VAC-50/60Hz by means of socket unit + switch		
Dimensions	330 x 200 x 80mm		
Supplied with	1 Ethernet RJ45 3-m cable. User's manual with tutorials.	1 Ethernet RJ45 3-m cable.	

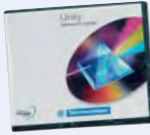
SOFTWARE OPTIONS



For PLC
MAT-BOX
For Touchscreen
TOUCH-BOX

ref. LOG-STEP

Very intuitive, it proposes an online help and tutorials allowing the user to start quickly with the different programming screen.



For PLC
AUTO-PRO
AUTO-PROA

ref. UNITY-SMALL

Very intuitive, it allows a multitasking programming. It can convert easily your programs made under PL7.



For PLC
AUTO-238
AUTO-238A
AUTO-221
AUTO-221-A
221-MAX

ref. SOMACHINE

Effective and open professional software solution wich includes Vijeodesigner. Include the programming of controllers and HMI interface (Human Machine Interface)

Réf.	AUTO-PRO	AUTO-PROA	AUTO-238	AUTO-238-A
Brand	SCHNEIDER			
Model	MODICOM M340		M238	
Number of Inputs	16 isolated inputs 24Vcc		14 inputs 24V	
Number of outputs	16 outputs 2A max - TOR		6 all or nothing outputs + 4 static outputs (24V)	
Analog	-	4 voltage / current inputs ±10V / 0-10V / 0-5V / 1-5V / ±5V 0-20mA / 4-20mA / ±20mA 2 voltage / current outputs ±10V / 0-20mA / 4-20mA	-	2 inputs 4-20mA / 0-10Vcc 1 output 4-20mA / 0-10Vcc
Ethernet	Ethernet module TCP/IP on RJ45		1 Ethernet port + 1 Modbus port	1 Ethernet port
Software	UNITY SMALL (in option)		SoMachine (in option)	
Power supply	230VAC-50/60Hz by means of socket unit + switch			
Dimensions	360 x 270 x 170mm		330 x 200 x 80mm	
Supplied with	1 ethernet RJ45 3-m cable.		1 ethernet RJ45 3-m cable. 1 USB cable.	



TOUCH-BOX



STU-BOX4

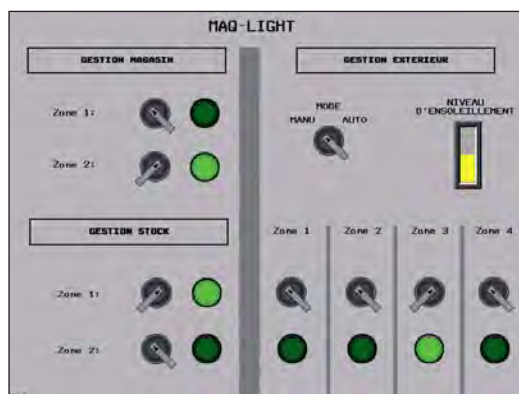
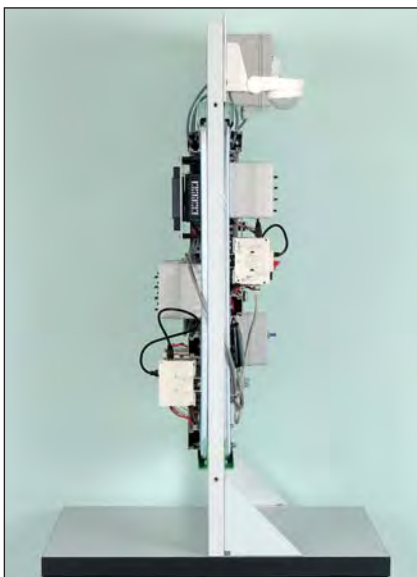


STU-BOX6

Managing of hypermarket lighting by supervision



Front view



Rear view

ref. MAQ-LIGHT

Large floor area buildings, like supermarkets, require a lot of lighting. The control of this lighting is a real economic and ecological issue which requires thinking about the concept of zoning and presence. MAQ-LIGHT offers the study of this need through controllers (PLC) and supervision controlled by 2 touch screens. The presentation with two-sided vertical panels on a wheeled frame provides an ergonomic view of the zones to be controlled.

Comprises

- 1 unit with magneto-thermal, RC protection devices & emergency stop.
- 3 SCHNEIDER® Ethernet PLCs
- 1 Ethernet colour touch screen HMIS5T 3.5"
- 1 Ethernet colour touch screen HMIS5T 5.7"
- 1 presence detector
- 1 Day / Night simulation unit with potentiometer
- 1 engraved face defining the 3 lighting zones
Face equipped with 16 indicator lights simulating the light points
- 3 control units with 7 pushbuttons and 7 indicator lights
- 1 Ethernet RJ45 switch
- 6 Ethernet leads, 1.5 metres

EDUCATIONAL OBJECTIVES

- Study and putting into service of a lighting management system for hypermarket by supervision
- Studying the configuration of an Ethernet type computer network
- Studying the programming of a PLC in contact language
- Studying the programming of an HMI (Human Machine Interface)
- Studying the coexistence of several PLCs and HMIs

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Creation of the architectural diagram of the electrical installation
- Creation of the computer Ethernet
- Creation of PLC programs in contact language
- Creation of the supervision from the two touch screens
- Change of IP addressing
- Testing the assembly

Features of the unit

- Power supply 230VAC by 3-metre mains cord
- Dimensions: 750 x 670 x h 1950mm
- Weight: 64 kg

Simulator for checking controller (PLC) programming



ref. PUP-PLC

Checking a PLC program requires the connection of an operative part.
PUP-PLC groups together a set of actuators, power supplies and components required for checking programs.
Its complete composition provides great comfort for this check.



Features

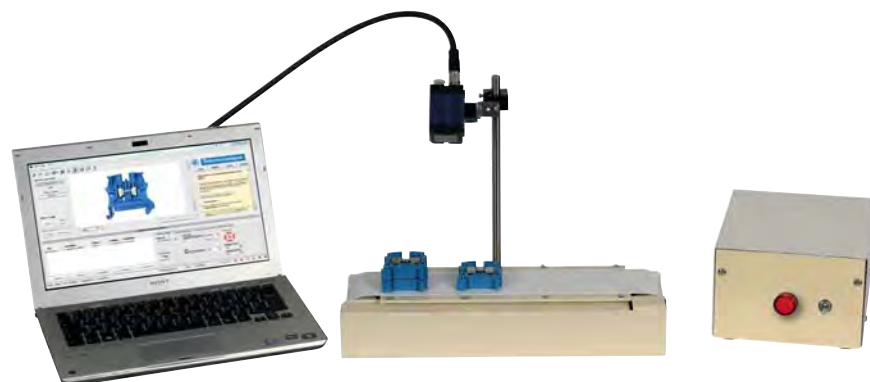
- 3-metre mains lead for power supply 230V-50/60Hz single phase.
- Console dimensions: 1000 x 160 x h 300mm. Weight: 14kg.

Composition of the console

- 1 Start / Stop button with indicator light (general control)
- 1 magneto-thermal + RC circuit-breaker 30mA
- 3 pushbuttons NO
- 3 pushbuttons
- 2 ON/OFF switches NO
- 2 ON/OFF switches
- 1 wind sensor, binary contact
- 1 light sensor, binary contact
- 3 limit switches NO
- 1 Temperature sensor PT100, 3-wire output
- 1 voltage generator adjustable by potentiometer from 0 to 10VDC

- 1 current generator adjustable by potentiometer from 4 to 20mA
- 1 dimmer 230VAC with control 0-10VDC
- 1 dimmer 230VAC with control 4-20mA
- 1 buzzer 24VDC
- 2 3-pole contactors 24VAC + 2 auxiliary contacts NO
- 3 green indicator lights 24VAC
- 3 red indicator lights 24VAC
- 1 source of fixed voltage 230VAC 50Hz
- 1 source of fixed voltage 24VDC
- 1 source of voltage 24VAC 50Hz
- 1 carrying handle

Quality control system by vision sensor



ref. MAQ-VISION

EDUCATIONAL OBJECTIVES

- Study and putting into service of a quality control system by vision sensor
- Creating the wiring for motorized conveyor belt and video and position sensors
- Using video recognition programming software

TEACHING RESOURCES STUDENT & TEACHER

Practical works proposed

- Carry out the configuration and programming of the video sensor using the software
- Creation of the wiring diagram
- Wiring of the conveyor belt, vision sensor and position sensor
- Testing with different part samples

Composition of the model

- Power supply unit, magneto-thermal protection device and indicator light.
- Motorized conveyor belt 24VDC.
- Colour vision sensor on height and tilt adjustable support.
- Binary position sensor.
- Indicator light for "nonconform part".
- 1 Configuration software.
- 2 part samples, conform and nonconform.

MAQ-VISION is a model equipped with a vision sensor combined with configuration software for part surveillance and recognition by video. This type of automatic visual quality control is nowadays used on many production lines. It enables the checking of parameters like presence, position, orientation, sorting, integrity and marking. It is also used for guiding before gripping. The image of the reference part and its acceptance tolerances are saved in the sensor's memory. The "good part" or "bad part" result is obtained from "binary" outputs.

MAQ-VISION is equipped with a motorized conveyor belt 24VDC. It carries the part under the sensor for checking. An indicator light signals if the part is conform or not.

Supplied with the video recognition programming software.

Features

- 2-metre mains lead for power supply.
- Dimensions of the housing: 240 x 180 x h 130mm.
- Dimensions of the conveyor belt: 300 x 110 x 120mm.

Portable solar central unit for isolated site with artificial light source



ref. SOL-PRO

The SOL-PRO solar unit includes:
1 technical case + 2 photovoltaic panels + 1 artificial light source (3 spotlights) + 2 cords for connecting the panels to the case.

EDUCATIONAL OBJECTIVES

- Understanding of a photovoltaic system in an isolated site.
- Understanding the safety components involved in the system.
- Understanding of the wiring of a photovoltaic system.
- Make electrical measurements of different parameters.
- Analyzing and interpreting results.
- Studying the performance and impacts related to the positioning of the solar panels.
- Studying of the the chain of solar energy (production, storage, use of the solar charge regulator for battery).

TEACHING RESOURCES STUDENT & TEACHER

A synoptic shows the different components and the interconnections.
Connection in jump wires by safety leads 4mm.
Connection of the panels to the technical case by 2 photovoltaic leads (delivered).
Measures are possible indoor by using the artificial solar source.



Electrical characteristics of the solar unit

- photovoltaic panel (panel features):
 - nominal power P_{mpp} : 30 Wc
 - max power voltage V_{mpp} : 18V DC
 - max power current I_{mpp} : 1.67 A
 - open circuit voltage V_{oc} : 22.5V DC
 - short-circuit current I_{sc} : 2A
- Power injected, with artificial source: 17 Wc (24V/0.7A)
- Output voltage 230 V - 50 Hz pure sinusoidal. 120 VA max.
- Output voltage 24V DC. 180W max

Composition of the technical case

- Case made of impact-resistant polypropylene. It can be closed without disconnecting the safety cords from the front. Light and easy to carry by its handle.
- 2 photovoltaic sockets for connecting solar panels.
- 1 surge arrester.
- 1 Start/Stop switch to isolate the solar panel circuit from the technical case.
- 4 two-pole fuse holders with gPV cartridge protecting the solar panel circuit, batteries and use.
- 1 24V/20A solar charge controller with display showing:
 - battery charge
 - current supplied by the solar panels
 - battery charge current
 - current consumed by the use circuit
 - battery voltage.
- 1 voltage converter pure sinusoidal 50 Hz - 24/230V AC, 120 VA.
Auto-protection by resettable thermal fuse.
- 1 set of 4 mm safety cords.
- 1 output 230V AC - 120 VA on 4 mm safety terminals
- 1 use output 24V DC - 180 VA on 4 mm safety terminals
- Dimensions: 540 x 430 x 215mm

Composition of the photovoltaic panels frame

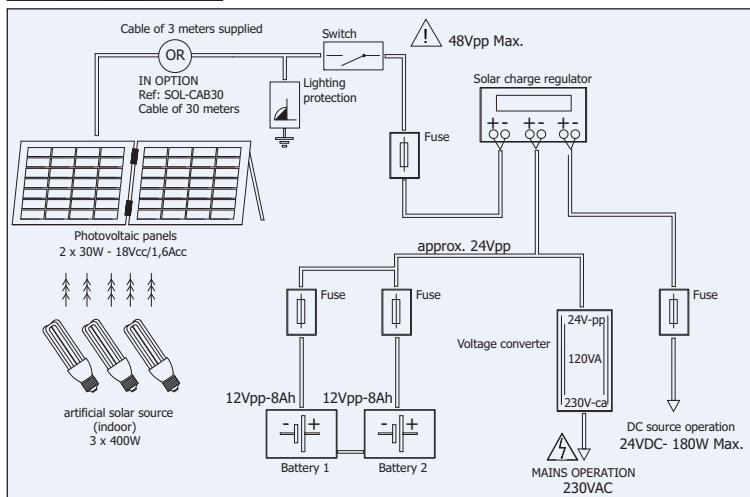
- Aluminium frame
- 2 mono-crystalline photovoltaic panels, each 30 Wc.
- 2 hinges for folding them together.
- Separate cabling for series or parallel connection.
- Useful surface area of the cells on each panel 0.2 m²
- 2 ball joints for putting the panels at the tilt angle required.
- 1 device for measuring the tilt angle.
- 2 3-metre photovoltaic cords.
- Light and easy to move (Carrying handle).
- Dimensions in unfolded position: 1140 x 470 x 200 mm
- Dimensions in folded position: 570 x 470 x 100 mm

Composition of the artificial light source

- 3 400W spotlights with variable tilt.
- Power supply 230V AC 50/60 Hz by 2-metre mains cord.
- Spotlight dimensions: 300 x 220 x h360 mm

Supplied with CD containing

- Theoretical summary of the different types of photovoltaic cells and energy.
- The detailed wiring diagram of the solar unit
- 5 theoretical assignments and 3 complete practical assignments as student/instructor book.
- Full instructions for each component



Self-contained public lighting with LEDs

MAQ-LED demonstrates public lighting with LEDs which is increasingly found in new housing schemes. Completely self-contained, the assembly operates using solar energy (Polycrystalline panel combined with a large capacity battery).

Two artificial solar sources, for connection to the mains 230VAC, enable the battery to be recharged for better organization of the explanations and practical assignments.

EDUCATIONAL OBJECTIVES

- Studying street lighting with LED lamp and solar energy.
- Putting a solar system into service.
- Demonstrating the ecological operation of LED technology.
- Discovering the different technologies of solar panels.
- Wiring the components of a lighting installation with presence sensor & light sensor.
- Reading the different electrical values of a production system of solar energy.
- Calculating the installation's efficiency.

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Lessons on the different solar panel technologies (Monocrystalline, Polycrystalline, Amorphous)
- Study on the positioning of solar panels for maximum output.
- Study of solar radiation.
- Reminder on Direct, Diffused and Reflected solar radiation.
- Interpretations of the theoretical curves produced from the 3 solar sensors.
- Study and creation of the wiring for a solar energy system in an isolated site.
- Reading the currents and voltages at different points of the wiring.
- Interpreting the measurements then calculation of the efficiency.
- Calculation of the discharge time of the battery according to the load.

Comprises

- Easy-to-move wheeled frame with large heavy-duty wheels.
- 1 Battery 12VDC – 90Ah.
- 1 Solar load regulator 12VDC-20A.
- 1 Plastic unit that is easy to remove to directly access the wiring of the battery, solar panel and load regulator.
- 1 Solar panel 12V/80W pivoting and swivelling on an easy-to-remove pole.
- 1 Lamp with LEDs 12VDC-50W equipped with a presence and light sensor.
- 2 artificial solar sources 230VAC on removable pole.



ref. MAQ-LED



Battery + load regulator unit.



Dimensions : 600 x 800 x 1700mm. Weight : 92kg.

Worksite traffic lights - LED technology - Self-contained

Simulator of worksite traffic lights powered with solar energy.
Two artificial and variable light sources simulate sunlight and enable the batteries to be recharged.
Fully self-contained, operation of the FEU-LED is managed with a Schneider® controller.
One solution for manually recharging the batteries is included in the electrical unit for better organization of the explanations and practical work.

ref. FEU-LED

EDUCATIONAL OBJECTIVES

- Study and putting into service of solar energy worksite traffic lights.
- Reminder on the different solar panel technologies.
- Wiring of the components of a photovoltaic installation at an isolated site.
- Reading the different electrical values of the production system of solar energy.
- Calculation of the efficiency of the installation.
- Programming a controller (PLC).

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Lessons on the different technologies of solar panels (Monocrystalline, Polycrystalline, Amorphous)
- Study on the positioning of solar panels for maximum output.
- Study of solar radiation.
- Reminder on Direct, Diffused and Reflected solar radiation.
- Interpretations of the theoretical curves produced from the 3 solar sensors.
- Study and creation of the wiring of a solar energy system at an isolated site.
- Reading the currents and voltages at different points of the wiring.
- Interpreting the measurements then calculation of the efficiency.
- Calculation of the discharge time of the battery according to the load.
- Creation of a controller program in contact language.

Comprises

Electrical cabinet

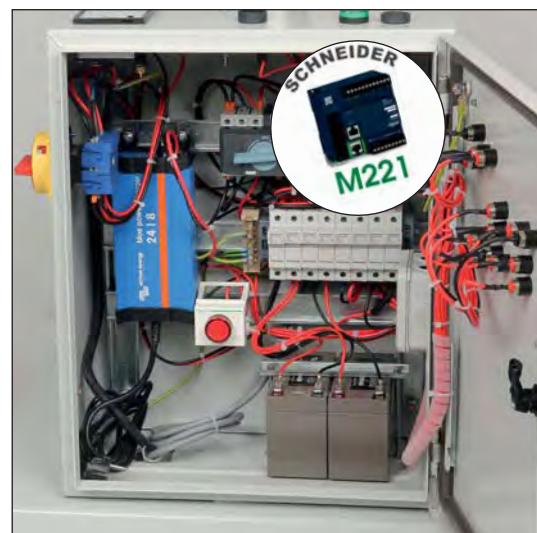
- 1 Voltmeter measures the voltage of the photovoltaic panels.
- 1 Voltmeter measures the voltage of the 2 batteries.
- 1 Set of pushbuttons, switches and indicator lights.
- 1 front synoptic gives the overall diagram of the system.
- 4mm connection terminals enable reading of U/I panels, U/I batteries, U/I charge and I charger.
- 1 SCHNEIDER® programmable logic controller (PLC).
- 1 solar load regulator 12VDC/20A.
- 1 battery charger 12V.
- 2 batteries 12V-8Ah.
- 1 set of electrical protection with gPV cartridge fuses.

Pole

- 2 traffic lights with Red / Orange / Green LEDs.
- 2 photovoltaic panels 30W/12V Monocrystalline.
- 2 artificial sources with light controller.

Features

- 3-metre mains lead included, for the charger and artificial source.
- Dimensions: 1000 x 1000 x 2035mm. Weight: 68kg.
- The pole and the panels are easy to remove for going through doorways.



Solar tracker with battery



EDUCATIONAL OBJECTIVES

- Study and putting into service of a solar tracker.
- Understanding the operation of solar cells.
- Mastering the wiring of the components of a photovoltaic installation at an isolated site.
- Taking measurements using an oscilloscope and clampammeter.

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Lessons on the different solar panel technologies (Monocrystalline, Polycrystalline, Amorphous)
- Study on the positioning of solar panels for maximum output.
- Study of solar radiation.
- Reminder on Direct, Diffused and Reflected solar radiation.
- Comparison of the read powers with fixed panels and tracking panels.
- Study and creation of the wiring of a solar energy system at an isolated site.
- Reading the currents and voltage at different points of the wiring.
- Interpreting the measurements then calculate the efficiency.
- Calculation of the discharge time of the battery according to the load.

ref. TRACSOL

The solar tracker is a technical innovation for tracking the sunlight, in order to increase the efficiency of photovoltaic panels. The productivity gain can reach 40% with a 2-axis tracking installation. TRACSOL is a teaching solution for learning this technique. Equipped with 2 axes and 4 cells for automatic sunlight tracking, it is completely self-contained. No connection to the mains 230V is required. Only the artificial solar source enabling TRACSOL to be used indoors is powered with 230VAC. The transparent sides of the mechanical box enclosing the two axes provide a full view of the chain drive linkages.

4 BNC attached to the front of the cabinet enable the reading on oscilloscope of the signals generated by the 4 solar cells.

The voltage of the solar panels is available on the two safety terminals.

The assembly is mobile thanks to 4 heavy-duty wheels attached under the frame.

Comprises

- 2 solar panels 30W-12V Monocrystalline.
- 1 azimuth rotation motor of 160° maximum, that is more than 8 hours of tracking in position perpendicular to the sun.
- 1 zenith rotation motor 43° for full tracking of the sun's elevation.
- 1 set of solar cells.
- 1 cabinet with door.
- 1 Solar load regulator 12V/20A.
- 1 battery 12V-14Ah.
- 1 output 12VDC-60W available on 4mm terminal.
- Protection with gPV cartridge fuse.
- Emergency stop and switch + 'on' indicator light.
- 1 printed side with 4 BNC plugs.
- 1 artificial solar source mounted on telescopic stand.

Features

- 3-metre mains lead for the artificial source.
- Dim.: 800 x 600 x h 1700mm. Weight: 80kg.
- The pole and the panels are easy to remove for going through doorways.

Three-phase wind turbine 400W



EOLYS-500 is a three-phase wind turbine 400W belt-linked to a driven motor that simulates the wind strength. This system is suited to class room conditions. It perfectly simulates wind turbine operation without noise or draughts since there is no fan. Protected by a transparent cover, the wind turbine can be seen with no risk of direct contact. EOLYS-500 is more than a simulator because it rotates a true three-phase generator and short blades.

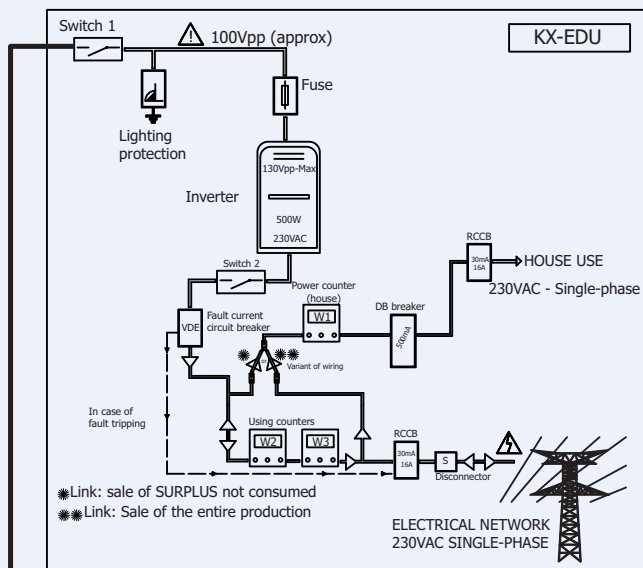
EDUCATIONAL OBJECTIVES

- Understanding the different elements of a wind turbine.
- Make the measurements of electrical parameters (3-phase and continuous).
- Analyzing and interpreting results.
- Studying the efficiency and impacts related to the wind force.
- Studying the chain of wind energy (production, storage, consumption, energetic behavior).
- Control and set a speed variator from a PC.

DELIVERED WITH TESTS & PRACTICAL WORKS



EXAMPLES OF COMPATIBLE LOADS



ref. EOLYS-500

Wind turbine features

- Three-phase output 3 x 53V AC - 400W at 370 rpm on safety terminals.
- Direct current output 90V DC - 400W at 370 rpm on safety terminals.
- Selection of these outputs by using an included rectifier or by direct connection.

Features of the wind simulation

- Squirrel-cage three-phase asynchronous motor.
- Speed controller simulating wind turbine speed 0-400 rpm.
- Using the supplied SOMOVE software, the PC operations are:
 - Acceleration of the wind speed.
 - Deceleration of the wind speed.

General features

- Wheeled frame with brakes
- Overall dimensions: 750 x 670 x (h) 1500 mm
- Top cover made with aluminium frame and Lexan sides (translucent and unbreakable).
- Power supply 2P+N+E 230V AC - 50/60 Hz (5m lead with mains plug)
- Supplied with: Practical assignments in the form of measurements/tests; RJ45-USB cable for linking between the speed controller and the PC. **Schneider® SoMove software.**



Supplied with SoMove

Three-phase wind turbine units, 400W

EDUCATIONAL OBJECTIVES

- Understanding the different parts of a wind turbine.
- Make the measurements of electrical parameters.
- Analyzing and interpreting results.
- Studying the efficiency and impacts related to the wind force.
- Study the chain of wind energy (production, storage, consumption, energetic behavior).
- Wiring of a wind turbine installation.

TEACHING RESOURCES STUDENT & TEACHER

Proposed practical works

- Studying and reading of the electrical features of the wind turbine.
- Calculate the system's efficiency.
- Realization of the diagram and wiring for the energy injection on the electrical network.
- Realization of a diagram & wiring for the energy use in an isolated site.



Reference EOL-1

1. WIND TURBINE 400W

- SEE opposite EOLYS-500

2. ELECTRICAL CABINET

Standard technical cabinet on wheeled frame.
Dimensions: 810 x 600 x 1890mm base included.

Comprises

- 2 disconnectors
- 1 500mA -30A RC device
- 1 30mA RC device
- 1 lightning arrester + fuses
- 3 100Wh resolution meters
- 1 Mushroom head emergency stop
- 1 source inverter
- 1 charging controller 12/24VDC-20A
- 2 batteries 12V-12Ah
- 1 set of photovoltaic connectors
- 1 500W inverter for network synchronisation
- 1 Voltage converter 24VDC/230VAC-200W

3. LINK CABLE

30-metre long cable for connection from the turbine to the electrical cabinet.

Réf	Features
EOL1	Operation with partial and total resale + at isolated site
EOL2	Partial or total resale operation only
EOL3	Operation at isolated site only

Each reference includes:

1 turbine (Ref. EOLYS-500) + 1 specific electrical cabinet + 1 link cable

PARTIAL OR TOTAL RESALE OPERATION

In the cabinet, a DC/AC inverter converts the DC current from the turbine into alternating current 220VAC 50Hz and feeds it into the grid in synchronism. This inverter is protected against any polarity reversal and any overload on the DC or AC side.

When the turbine is stopped, the inverter consumes no current

INVERTER	VOLTAGE	Max current	Power
INPUT	65~125VDC	8A	
OUTPUT	230VAC-50Hz	2,25A	525VA

OPERATION AT ISOLATED SITE

The turbine current charges two 12V sealed batteries cabled in series through a charging controller. This DC voltage is either available on safety terminals at the rear of the cabinet, or transformed into 250VAC 50Hz voltage by a 200W voltage converter.

Technical characteristics for the isolated site converter

VOLTAGE CONVERTER	Voltage	Max Current	Power
INPUT	20~32 VDC	11A	210W
OUTPUT	230VAC 50Hz	1.5A	300VA

Automatic leak alert system



Model ref. MAQ-FUIT-A.

Length: 1005mm.

EDUCATIONAL OBJECTIVES

- Learning about water leak detection by sensor.
- Using a GSM phone transmitter
- Using and programming a ZELIO logic module

TEACHING RESOURCES STUDENT & TEACHER

practical works

- Configuration and installation of the water leak sensor
- Configuration of the GSM phone transmitter and test with mobile phone
- Creation of the ZELIO logic module programmes with or without presence in the home, with or without solenoid valve control.

Fully self-contained version thanks to its tank and pump 24V. Requires no water inlet.

ref. MAQ-FUITE-A

Version with no pump or tank. Requires a pressurized water inlet in the room.

ref. MAQ-FUITE

A leak of water can be very costly and statistics show that this fault is common at all distribution points. This model represents the drinking water supply circuit of a house equipped with a leak detection system and GSM alert device. When the house is declared unoccupied, a sensor, connected to the water meter, detects the slightest abnormal consumption. A GSM phone transmitter then sends an SMS to warn you of the problem. The assembly is managed by a ZELIO logic module.

PULSE WATER METER

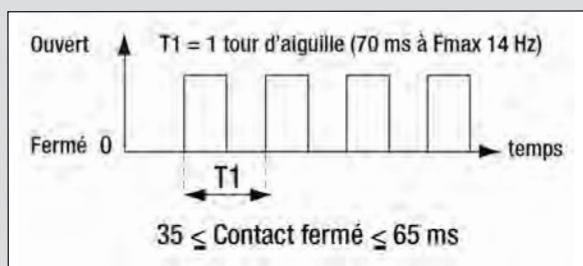
ref. CHT-EAU



Water meter equipped with 2-wire pulse transmitter for remotely sending information relating to the water meter.

Ratio K = 1 - 1 meter unit equal to 1 pulse.

Connection to the water circuit using 2 quick connectors (not supplied).



Composition OF THE sytem

- 1 tank, 5 litres (for the MAQ-FUITE-A version)
- 1 pump 24VDC - 3.5A (for the MAQ-FUITE-A version)
- 1 quick connector for water inlet (for the MAQ-FUITE version)
- 1 water meter
- 1 pulse sensor attached to the meter
- 1 solenoid valve 24V
- 1 valve for creating a water leak
- 1 valve for cutting off the water inlet
- 1 unit with connector for linking to the technical cabinet

Composition of the technical cabinet

- 1 set of magneto-thermal and RC protection devices.
- 1 modular power supply 24VDC.
- 1 ZELIO logic module
- 1 GSM transmitter
- 1 set of switches, emergency stop and indicator lights

Features

- Dimensions of the frame
 - MAQ-FUITE-A version: 370 x 230 x 1005mm.
 - MAQ-FUITE version: 370 x 230 x 700mm.
- Technical cabinet dimensions: 330 x 200 x 440mm
- Total weight, frame + cabinet
 - MAQ-FUITE-A version: 25kg.
 - MAQ-FUITE version: 19 kg
- Mains power supply 230V + E with 3-metre lead
- Requires phone SIM card with subscription or prepaid.

Speed controller used for energy saving



EDUCATIONAL OBJECTIVES

- Energy savings by speed controller demonstrated.
- Creation of the configuration of a speed controller with software.
- Using an energy measuring unit.
- Using a clamp ammeter.

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Configuration of the speed controller with software.
- Configuration of the energy measuring unit.
- Comparison of energy consumption.
- Calculation of the cost of depreciation of the speed controller.
- Reading and plot of the electrical characteristics.

ref. MAQ-WATT

In a pumping or ventilation installation, the motor, supplied direct from the mains, rotates at its nominal speed. The flow rate can be regulated with manual valve or speed controller. The speed controller enables significant electricity savings to be made, which is not the case of the manual valve.

MAQ-WATT demonstrates this phenomenon by comparing the consumption in the two situations.

2 types of operation are offered:

- Direct supply of the pump with a contactor and regulation of the water flow with manual valve.
- Supply of the pump with controller and regulation of the flow rate by variation of the speed of rotation.

A measuring unit compares, among other things, the 2 powers absorbed.

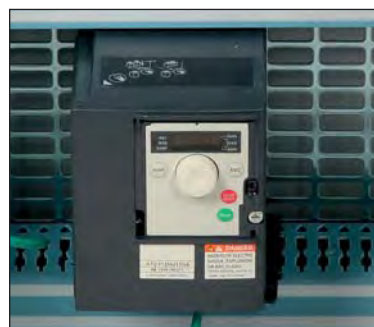
A float provides a visual indication of the flow rate.

Comprises

- Wheeled frame.
- One surface pump 750W – three-phase 400VAC. Self-priming and protected against dry running.
- A 30-litre water tank makes the model self-contained.
- A manual valve for regulating the water flow.
- A float flow rate indicator.
- A cabinet with top engraved showing the diagram of operation of the system.
- A set of magneto-thermal and RC protection devices.
- A set of switches and indicator lights to select the type of operation required.
- An energy measuring unit with display of P/Q/S/I/U/V/Cosphi.
- Speed controller with software. 1500W – three-phase 400VAC.
Offset control box for controlling the controller from the top of the cabinet.
- 3 safety sockets are available at the output of the speed controller for the connection of your own pump or any other load as a fan (3x 400V / 1.5kW max.)

Features

- Three-phase mains lead 400V 3 metres long for power supply.
- Dimensions: 600 x 800 x h 1400mm. Weight: 85kg.



Adjustable work tops, Seated / Standing

SINGLE AND TWO-SIDED TOOL-HOLDER WORKSTATIONS

Laminated top 22mm thick.
Top position adjustable.
Max height 920mm (top included)
Independent adjustment of each top in the two-sided versions.
Max load 200kg uniformly distributed.
Matt anodized aluminium stand and structure. Lasting protection against scratching and corrosion.

- Tool-holder frame equipped with:
- 20 plastic hooks for screwdrivers
 - 2 tool-holder hooks
 - 1 tool-holder support 240 x 80mm
 - 1 magnetic support
 - 1 universal support Ø80mm
 - 1 document holder (A4 size)
 - 8 double-sided places
 - 1 strip with 5 2P+E outlets and switch



SINGLE MODELS

Width / Depth / Height	Ref.
1200 x 910 x 2000mm	PTE1-1200
1500 x 910 x 2000mm	PTE1-1500
2000 x 910 x 2000mm	PTE1-1800



TWO-SIDED MODELS

Width / Depth / Height	Ref.
1200 x 1660 x 2000mm	PTE2-1200
1500 x 1660 x 2000mm	PTE2-1500
2000 x 1660 x 2000mm	PTE2-1800

SINGLE WORKSTATIONS



Laminated top 22mm thick.
Workbench height: Adjustable. Maximum height 920mm (top included).
Matt anodized aluminium stand.
Lasting protection against scratching and corrosion.
Maximum load 200 kg uniformly distributed.

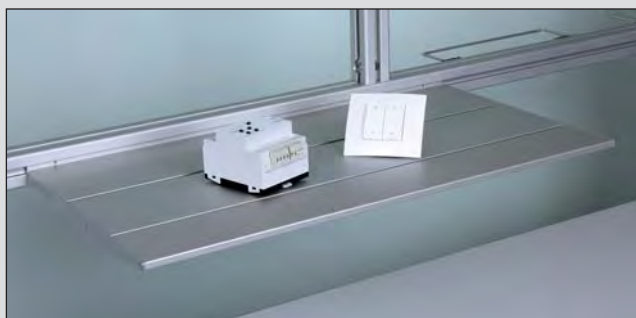
Dimensions (mm)	Ref.
1200 x 750	PTE3-1200
1500 x 750	PTE3-1500
1800 x 750	PTE3-1800

TWO-SIDED WORKSTATIONS



Laminated top 22mm thick.
Workbench height: Adjustable. Maximum height 920mm (top included).
Independent adjustment of each top.
Matt anodized aluminium stand.
Lasting protection against scratching and corrosion.
Maximum load 200 kg uniformly distributed.

Dimensions (mm)	Ref.
1200 x 1660	PTE4-1200
1500 x 1660	PTE4-1500
1800 x 1660	PTE4-1800

SHELF OPTION

Sliding metal shelf for full support width.
Dimensions 600 x 320mm.

ref. PTE-TAB

KEYBOARD/MOUSE SUPPORT OPTION

Sliding metal shelf lockable in pulled out position.
Folding support for mouse.
Width: 520mm.
Depth: 300mm (wrist rest included).

ref. PTE-CLAV

CENTRAL PROCESSING UNIT SUPPORT OPTION

Support screws under the table. Sliding system for taking central processing units of all sizes.
Rotary system for pivoting the central processing unit.

ref. PTE-UC

Workbenches**SINGLE WORKBENCHES**

Innovative composite material stand (70% wood fibre).
It is neutral to magnetic fields and electrically insulating.
High-temperature laminated top, 22mm thick.
Overall height (top included): 742mm.
Colour: 2 shades of grey.
Max load: 200kg.

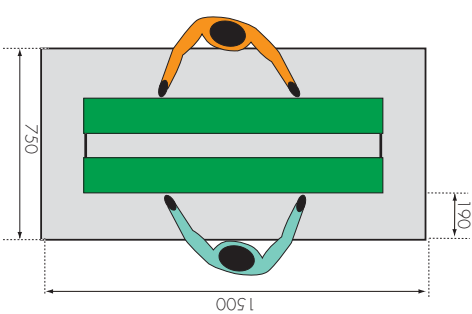
Dimensions (mm)	Ref.
1500 x 750	TLG-1500
1800 x 750	TLG-1800
2000 x 750	TLG-2000

SINGLE WORKBENCHES WITH ELECTRIC STRIP

Innovative composite material stand (70% wood fibre).
It is neutral to magnetic fields and electrically insulating.
High-temperature laminated bench-top 22mm thick.
Overall height (top included): 742mm
Colour: 2 shades of grey
Max load: 200 kg
Electric strip equipped with 4 2P+E outlets
with indicator light and circuit-breaker.

Dimensions (mm)	Reference ●	Reference ●
1500 x 750	TLV-1500	TLO-1500
1800 x 750	TLV-1800	TLO-1800
2000 x 750	TLV-2000	TLO-2000

Multifunction home learning workstation



Workbench for learning how to mount and connect home components.
Two learners are separated by two independent frames 1200 x 800mm.
These frames can take wood plates, industrial frames or the BA13 plaster panel.
Speedy installation and replacement of work supports (plate, frame, BA13 plaster panel).
• High-temperature laminated top 40mm thick, dimensions 1500 x 750mm.
• Maximum dimensions of wood plate or BA13 or wiring frame: 1150 x 785 x 15mm thick.

Reference ● P1O-2P-N

Reference ● P1V-2P-N

There are other solutions as
opposite with a workbench
2400 x 750mm with 3 feet,
for accommodating 4 learners
at the same time.

Please contact us
to give us your ideas.

We can prepare a free estimate
for you with 3D illustrations.



Storage unit for grids

Simple and economical solution for storage of 16 or 24 grids.
16 compartments model :
Dimensions 1890 x 665mm - Height 850mm without grid.
24 compartments model :
Dimensions 1890 x 665mm - Height 1630mm without grid.

Compartment	Reference ●	Reference ●
16	V-MILABO16	O-MILABO16
24	V-MILABO24	O-MILABO24





QUICK-ELEC

NEW CONCEPT QUICK-ELEC



THE NEW QUICK-ELEC CONCEPT IS A MODULAR TEACHING SOLUTION PERFECTLY SUITED TO ELECTRICAL ENGINEERING COURSES

The frames (3 models available) are made of light and sturdy anodized aluminium sections. Equipped with a power supply panel, they connect directly to the 230V mains on a 2P+E socket.

The different modules (H 250mm) are very easy to position on the rail system.
Cabling is carried out using 4-mm safety leads.

DISCOVER THE NEW CONCEPT ON PAGES 66 TO 69

Choice of frames



ref. MODULO-1

- Wheeled frame.
- Takes 20 modules (W-166mm x H-250mm)
- Dimensions: H-1610 x W-940 x D-500mm



ref. MODULO-2

- Wheeled frame.
- Takes 20 modules (W-166mm x H-250mm)
- Wood shelf 1500 x 350mm, with easy height adjustment
- Dimensions : H-2040 x W-1620 x D-650mm



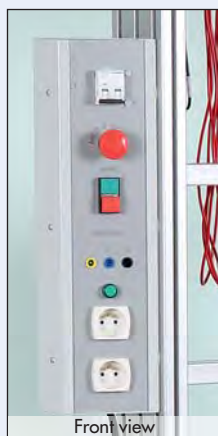
ref. MODULO-3

- Frame for attaching to a table. (table not supplied)
- Takes 24 modules (W-166mm x H-250mm)
- Dimensions (without table): H-1100mm x W-1500 x D-500mm
- Depth adjustable using 2 slides attached to your table. Horizontal travel 250mm.

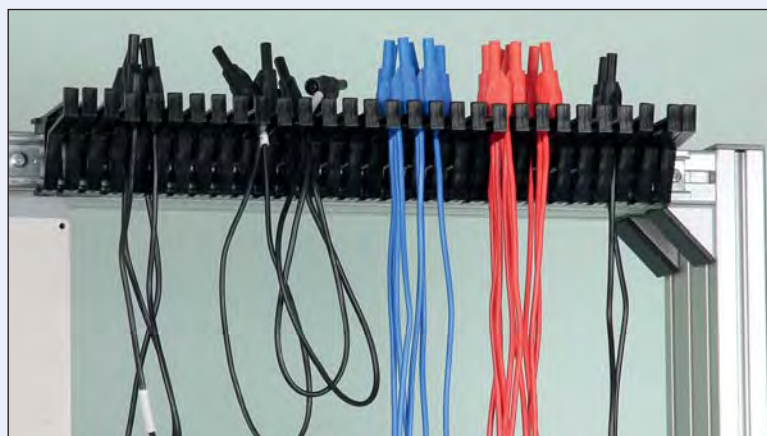
Common elements to the three frame models



Rear view



Front view



Power supply panel

Front:

- 1 16A circuit-breaker (30mA residual current circuit breaker as an option)
- 1 Emergency stop button
- 1 Pushbutton + ON indicator light
- 1 Mains output 230V+E on 4-mm safety terminals
- 2 Mains sockets 2P+E 230VAC

Rear:

- 10 Mains sockets 2P+E 230VAC

Rack for leads

- Length: 50cm.
- 30 fingers.
- The assembly can be moved longitudinally over the whole width of the frame.
- Positioned at the back of the frame.

Options compatible with MODULO frames



SCREEN/KEYBOARD SUPPORT

- Screen support arm
- 3 rotation points on 2 ball joints
- Supports screens up to 12kg
- With shelf for keyboard and mouse

ref. QUICK-ECRAN

CAPACITIVE LOAD

- Adjustable from 0 to nominal power
- 6 switches
- Jumpers for coupling
- Power 0.5 or 2 or 4kVAR

ref. QUICK-CH05 (0.5KVAR)

ref. QUICK-CH20 (2KVAR)

ref. QUICK-CH40 (4KVAR)



The loads are designed to be easily removed from the frame.



CENTRAL UNIT SUPPORT

- Wire mesh 45x45mm
- Cabling space to rear
- Epoxy paint
- Dimensions: 400x400x195mm

ref. QUICK-UC

RESISTIVE LOAD

- Adjustable from 0 to nominal power
- 6 switches
- Jumpers for coupling
- Power 0.5 or 2 or 4kW

ref. QUICK-RHP05 (0.5KW)

ref. QUICK-RHP20 (2KW)

ref. QUICK-RHP40 (4KW)



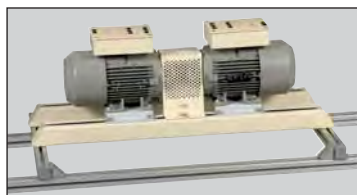
WIRING FRAME

Equipped with:

- 1 Omega rail 300mm
- 1 set of 20 terminals 6mm²
- 1 box equipped with 20 safety terminals Ø4mm
- Dimensions 500x350mm

The frame can be removed instantly without tools.

ref. QUICK-GRIL



GUIDE RAILS

- Rails for rotating machines.
 - The distance between the rails can be adjusted from 70 to 380mm
 - Dimension: Length 900mm
- Supplied with sliding nuts.

ref. QUICK-RGA

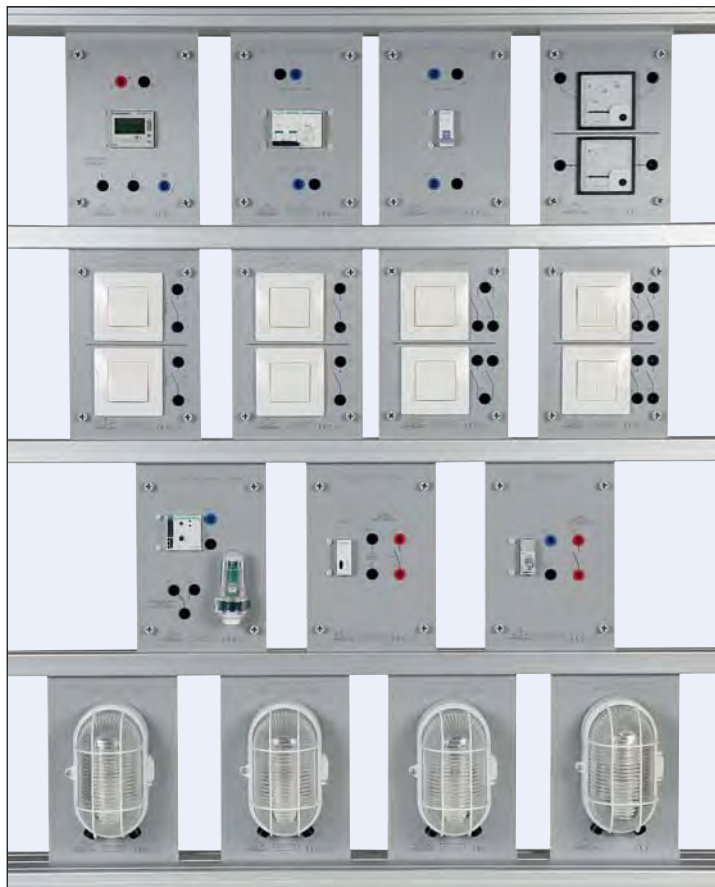


STORAGE CABINET FOR MODULES

Takes at least 80 modules.

SEE PAGE 44
REF. HB58

Study of different wiring for lights



EDUCATIONAL OBJECTIVES

- Study of house wiring diagrams.
- Study and operation of a single lighting circuit.
- Study and operation of a double lighting circuit.
- Study and operation of a two-way circuit.
- Study and operation of a remote control switch circuit
- Study and operation of a timer circuit.
- Study and operation of a dusk switch circuit.
- Study and operation of an energy meter.

TEACHING RESOURCES STUDENT & TEACHER

Proposed Practical Works

- Creation of house lights wiring diagrams.
- Creation of different light wiring such as single, double, two-way, timer, remote control, dusk switch.
- Creation of energy meter wiring.
- Creation of reading of light power consumption.

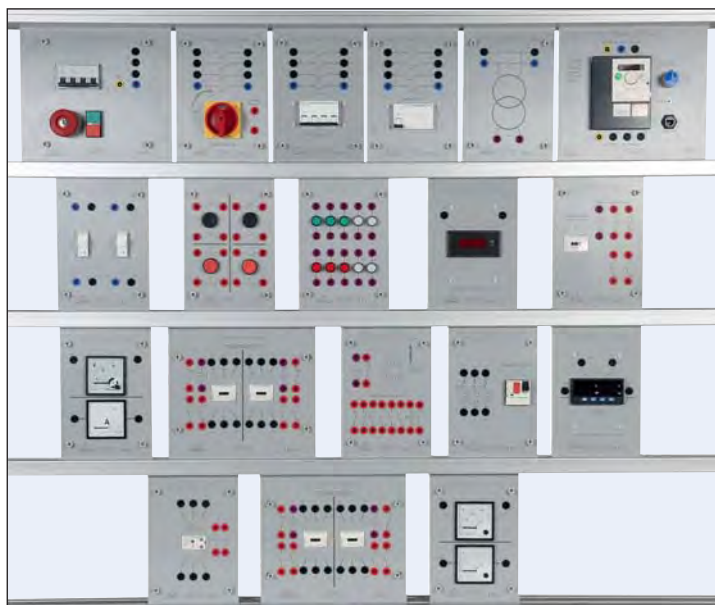
ref. QUICK-A

Set of modules for studying the different types of wiring of lights.
The modules are cabled using safety leads Ø4mm.

Comprises

- 1 Module – Two pushbuttons
- 1 Module – Two-way switch
- 1 Module - Two single lighting switches
- 1 Module – Two double lighting switches
- 1 Module – Single phase energy meter 63A
- 1 Module – Circuit-breaker 1P+E 16A
- 1 Module – Residual current circuit-breaker 30mA
- 1 Module – Timer, coil 230VAC-50Hz
- 1 Module – Remote control switch, coil 230VAC-50Hz
- 1 Module – Dusk switch + photocell
- 1 Module – Analogue ammeter 2.5A and Analogue voltmeter 250VAC
- 4 Modules – Bulkhead lights 230VAC-40W
- 1 set of safety leads for carrying out the different practical works.

Study of wirings for starting asynchronous motors



EDUCATIONAL OBJECTIVES

- Study of wiring diagrams for starting asynchronous motors.
- Study and operation of direct start-up.
- Study and operation of direct start-up with reversal of the direction of rotation.
- Study and operation of star/delta start-up.
- Configuration of a speed controller with software.
- Study and operation of start-up with speed controller.
- Using a digital wattmeter, ammeter and voltmeter.

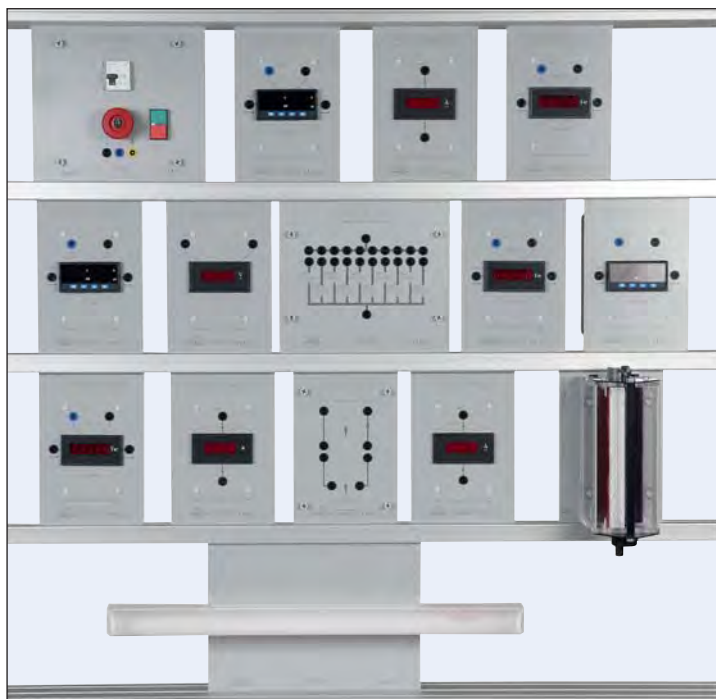
TEACHING RESOURCES STUDENT & TEACHER

Proposed Practical Works

- Creation of the wiring diagrams of different types of motor start-up.
- Creation of the different wirings of motor start-ups such as direct, direct with reversal of the direction of rotation, star/delta, with speed controller.
- Configuration of the speed controller using the SOMOVE software from Schneider
- Reading of the currents and voltages at the terminals of the asynchronous motor.
- Calculation of the absorbed power.

ref. QUICK-C

Study of power factor rectification



EDUCATIONAL OBJECTIVES

- Study of the power factor.
- Study of the powers.
- Demonstrate the advantage of rectifying power factor on the kWh cost

TEACHING RESOURCES STUDENT & TEACHER

Proposed Practical Works

- Study of an industrial lighting installation using a fluorescent tube: Readings of current, power and voltage in each energy transmission line.
- Creation of the Fresnel diagram using active and reactive powers.
- Study of pure inductance in order to determine the capacitor battery to be installed.
- Study of resonance, max/min current.

ref. QUICK-L

Set of modules for studying the $\cos \phi$ rectification of an electrical installation.
The modules are cabled using safety leads $\varnothing 4\text{mm}$.
Compatible load 230V-5A Max.

Comprises

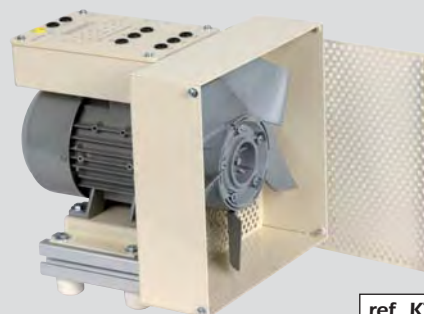
- 1 Module – Distribution of single-phase voltage 230VAC-50Hz
- 3 Modules – Digital ammeters 5A
- 1 Module – Digital voltmeter single-phase 230VAC
- 3 Modules – Digital multifunction displays 230VAC-5A. Displays of P/U/I/Power factor.
- 3 Modules – Reactive power 230VAC-5A.
- 1 Module for load connection
- 1 Module – battery of 10 capacitors 0.1 to $41\mu\text{F}$ with jumpers.
- 1 Module – safety inductance, variable from 0.1 to 1.4H - 2A
- 1 Module – Fluorescent tube 230VAC-18W
- 1 set of safety leads for carrying out the different practical works.

Set of modules for studying the different types of wiring for starting asynchronous motors.
The modules are cabled using safety leads $\varnothing 4\text{mm}$.
Compatible with asynchronous motors 400/690V 1500W max.

Comprises

- 1 Module – Distribution of three-phase voltage +E 400V-50Hz
- 1 Module – Emergency stop
- 1 Module – 2 two-pole cut-out devices
- 1 Module – Four-pole magneto-thermal circuit-breaker 4A D-curve
- 1 Module – Residual current four-pole switch 30mA
- 1 Module – Three-pole magneto-thermal circuit-breaker, motor support
- 1 Module – Four-pole isolating switch
- 1 Module – Transformer 230V/24VAC-50Hz 120VA
- 1 Module – Four pushbuttons
- 1 Module – 10 indicator lights 24VAC-50Hz
- 1 Module – Reversing contactor 24VAC-50Hz with 2NO+2NC
- 2 Modules – Contactors 24VAC-50Hz with 2NO+2NC
- 1 Module – Timed contactor 24VAC-50Hz
- 1 Module – Thermal relay
- 2 Modules – Analogue voltmeter (400V) and ammeter (10A) displays.
- 2 Modules – Digital wattmeter displays.
- 1 Module – Speed controller 1.5kW power supply and three-phase 400V output.
- 1 set of safety leads for carrying out the different practical works.

FAN OPTION



ref. KT-1M

Protection grid removed for photo purposes only

QUICK-C can be completed by a fan.

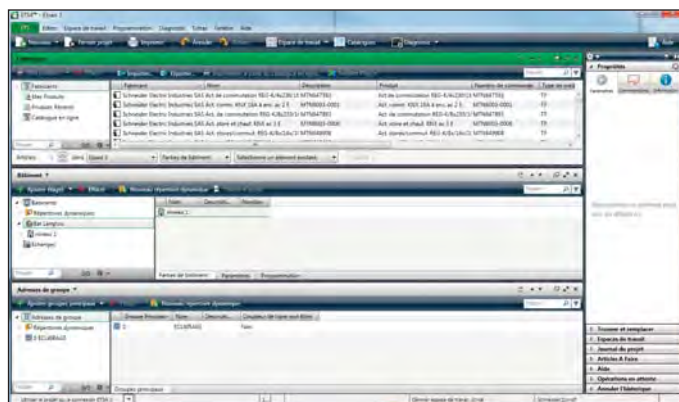
- 300W 400/690V three-phase fan
- Rated speed 1500 rpm
- Power supply through 4mm dual chamber safety terminals

Study system for the KNX bus



Features

- Power supply 230VAC by 5-metre mains cord
- Dimensions of the frame: 950 x 50 x 1620mm
- Dimensions of each module: 250 x 165 mm
- Total weight: 50 kg



ETS Lite programming software

Additional KNX
modules
See Page 54



EDUCATIONAL OBJECTIVES

- Studying KNX communication media
- Studying the principle of a home control installation with KNX devices
- Configuration of KNX devices
- Creating the wiring of KNX devices
- Creating home control scenarios

TEACHING RESOURCES STUDENT & TEACHER

Practical works

- Creation of the complete wiring diagram
- Study the creation of KNX wiring and programming for the functions of lighting control, shutter and opening control using pushbuttons
- Creation of home control scenarios like using a single key to switch off the lights, lower the blinds and open the garage door and the gate
- Combine several different brands makes with the same KNX standard

ref. DOMO-KNX

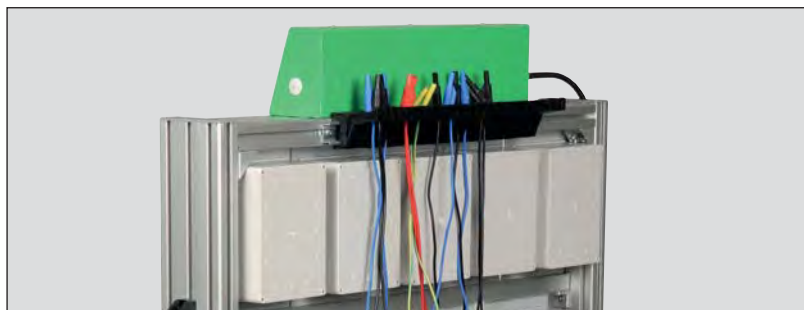
The KNX bus offers a standard of compatibility and interoperability that is unique and global in the home control sector.

With "KNX PARTNER" certified manufacture, the DOMO-KNX model enables the study and putting into service of multibrand KNX products, SCHNEIDER® and HAGER® (other on request). The KNX devices are prepared in plastic housings with the front engraved and equipped with Ø4mm terminals. The wiring of the Bus and the power are then created using safety leads. We selected the most commonly used KNX modules in the "intelligent home" domain. These modules are easy to install on the aluminium wheeled frame.

The KNX devices are configured using the ETS Lite tool (20 participants max.) supplied with the model.

Comprises

- 1 Aluminium wheeled frame taking 18 modules
- 1 Power supply console 230VAC on Ø4mm terminals protection by RC circuit-breaker 30mA + emergency stop + 2 2P+E outlets with indicator light
- 1 Rack for leads - 20 fingers
- 1 30V power supply module for the bus
- 1 USB interface module for programming from a PC
- 2 4-key pushbutton modules with indicator lights (1 per brand)
- 1 2-key pushbutton module with indicator lights
- 1 universal pushbutton interface module
- 1 Presence detector module
- 1 4-output switch actuator module
- 1 2-output switch actuator module
- 1 2-output control actuator module
- 1 1-output control actuator module
- 1 2-output roller blind actuator module
- 1 Module with printing and signalling for two roller blinds
- 1 Module with printing and signalling for opening / closing gate and garage
- 4 Modules for bulkhead lights 60W – 230VAC



KNX bus study devices kit

This kit is a set of devices for studying and putting into service SCHNEIDER® and HAGER® multibrand KNX products.

The KNX devices offered are the most commonly used ones in the "intelligent home" domain.

The ETS Lite configuring software (20 participants max.) is supplied. Kit ready for installation in a modular panel (electrical protection to be provided).



ref. KI-KNX

The kit comprises

- 1 30V power supply for the bus.
- 1 USB interface for programming from a PC.
- 2 4-key pushbuttons with indicator light (1 per make).
- 1 2-key pushbutton with indicator light.
- 1 presence detector.
- 1 4-output switch actuator.
- 1 2-output switch actuator.
- 1 2-output control actuator.
- 1 1-output control actuator.
- 1 2-output roller blind actuator.
- 4 Bulkhead lights 60W – 230VAC.
- ETS Lite configuration software.

Additional KNX modules (compatible with our KNX system - See P. 153)

KNX HEATING CONTROL LOT

- 2-key pushbutton module with indicator light.
- Thermostat module with programming screen + keys.
- 2-output switch actuator module.
- Resistive load module 320W – 230VAC + indicator light.

ref. DOMO-1



SMARTPHONE CONTROL LOT

- InSideControl gateway module with power supply
- WiFi switch module

The InSideControl gateway links the KNX installation to the IP network (LAN).

Up to 5 smartphones / tablets can control the installation using the InSideControl "App/HD App, available for IOS and Android.

The gateway can be used as access interface to the bus (e.g. for ETS programming).

The functionalities of the application are configured with the InSideControl Builder software supplied. Smartphones or tablets communicate with KNX devices by WiFi.

The Smartphone and the InSideControl App/HD App are not supplied with the lot.

ref. DOMO-3



HEAT AND LIGHT SENSOR LOT

- Hager 4-output switch actuator module
- Schneider heat and light sensor module

ref. DOMO-4



KNX TOUCH SCREEN CONTROL LOT

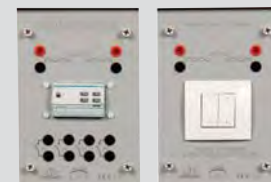
The touch screen is used to view the states and control the KNX functionalities

- 7" touch screen (17.8cm) 65000 colours.
- Power supply 230VAC 50-60Hz.
- USB port
- LAN interface (10/100 Mbit/s)

ref. DOMO-2



Study system for
the KNX bus
See Page 153



"Intelligent Home" energy control system



Characteristics

- Power supply 230V AC by 5-metre mains cord
- Dimensions of the frame: 950 x 50 x 1620 mm
- Dimensions of each module: 250 x 165 mm
- Total weight: 50 kg



EDUCATIONAL OBJECTIVES

- Study a measurement system for energy consumption according to standard RT2012.
- Study the principle of a home control installation equipped with DELTA DORE® radio components
- Parameter the DELTA DORE® radio components (RF technology)
- Produce wiring for home components.
- Learn how to use a clamp ammeter.

TEACHING RESOURCES STUDENT & TEACHER

Possible practical works

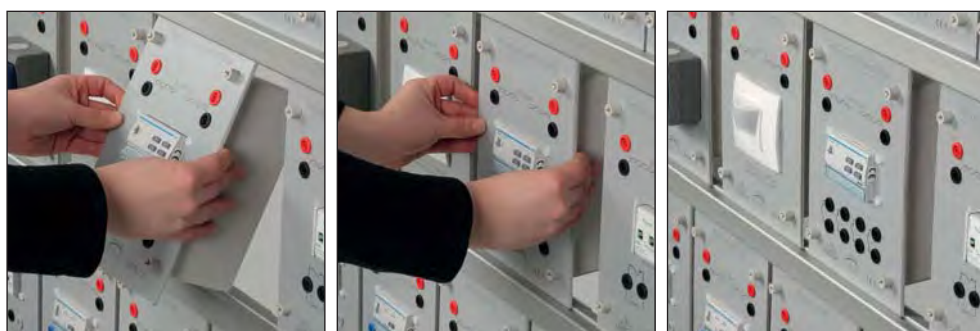
- Production of the complete wiring diagram.
- Study of the production of the wiring and programming of the components from the DELTA DORE touch screen module
- Study and production of radio commands for lighting, roller blinds and heating.
- Reading of power according to the heating operating cycles.
- Comparison of the power displayed on screen with that calculated from the different readings.
- Creation of scenarios according to the outside temperature and sunshine.

ref. MAQ-NRJ

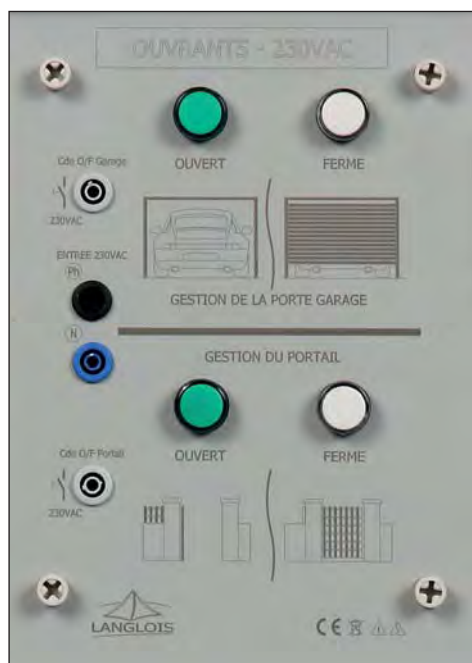
More and more standards and directives require individual homes to be equipped with a system enabling energy consumption to be measured or estimated. MAQ-NRJ groups all the DELTA DORE® components needed to learn about electrical energy consumption. A colour touch screen module displays all the energy use information as graphs. The different components are prepared in plastic housings engraved and equipped with 4 mm terminals to facilitate and make safe the wiring using safety leads. The modules are very easy to install on the aluminium wheeled frame.

Composition

- One wheeled aluminium frame taking 4 rows of 5 modules
- One power supply console 230 V AC on Ø 4 mm terminals
 - protection by 30mA RC circuit breaker
 - emergency stop button
 - 2 2P+E sockets with lamp
- 1 rack for leads - 20 fingers.
- 1 Module - data transmitter with off-peak hours control
- 1 Module - colour touch screen displaying all the detail of consumption, for controlling heating (pilot wire and load shedding), lighting and roller blinds.
- 1 Module - 3 current transformers (max 60A) for measuring 3 different circuits.
- 1 Module - power interface technical unit for touch screen.
- 1 Radio module - sunlight sensor.
- 1 Radio module - outside temperature sensor
- 2 Radio modules - roller blind control
- 1 Simulation module - 2 blinds.
- 1 Radio module - lighting variation.
- 1 Radio module - lighting variation, off/on, timing
- 2 Modules - bulkhead lights 230V AC - 60 W
- 3 Modules - load 320 W + indicator lights
- 1 Simulation module - 3 pilot wire convactor heaters, 1 hot water tank and 1 pellet burner.



Rapid installation of modules on the frame



Openings control module



Roller blind interface module

The colour touch screen module displays all the detail of consumption, for controlling heating (pilot wire and load shedding), lighting and roller blinds.

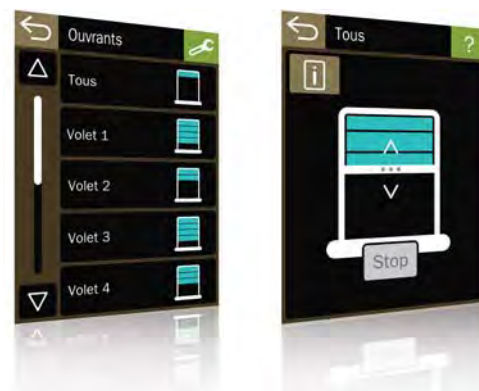


KIT OF COMPONENTS FOR HOME ENERGY CONTROL

We propose, with this kit of modular panel devices, an alternative enabling your study of intelligent home energy control. Supplied without cables or electrical protective devices.

- 1 data transmitter with off-peak hours control.
- 1 colour touch screen module displays all the detail of consumption, for controlling heating (pilot wire and load shedding), lighting and roller blinds.
- 3 current transformers (max 60A) for measuring 3 different circuits.
- 1 Module - power interface technical unit for touch screen.
- 1 sunlight radio sensor.
- 1 outside temperature radio sensor.
- 2 radio controls for roller blinds.
- 1 lighting variation radio control.
- 1 lighting variation, off/on, timing control.
- 2 bulkhead lights 230V AC – 60 W.

ref. KI-NRJ





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